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EXAMINER
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BAUM, RONALD

ART UNIT	PAPER NUMBER
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2136

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10/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/661,696

Applicant(s)

BRANDT ET AL.

Examiner

Ronald Baum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 20071023.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. This action is in reply to applicant's correspondence of 24 August 2007.
2. Claims 1-9, 11-41 are pending for examination.
3. Claims 1-9, 11-41 are rejected.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9, 11-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Swiler et al, U.S. Patent 7,013,395 B1.

5. As per claim 1; "A security analysis tool for an automation system, comprising:  
an interface component to generate

a description of factory assets, wherein

the description includes at least one of

shop floor access patterns,

Intranet access patterns,

Internet access patterns, and

wireless access patterns [ABSTRACT, figures 1-2 and associated

descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer

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*system analysis tool using inputted computer system/network configuration/topology (i.e., description of factory assets, clearly dealing with Intranet and Internet access patterns insofar as network security per se is concerned) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.]; and*

an analyzer component to generate

one or more security outputs

*based on the description [ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information, such that results (i.e., post analysis generated security outputs) used to evaluate (i.e., graphed output information)/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.].”.*

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As per claim 12, this claim is the method claim for the system claim 1 above, and is rejected for the same reasons provided for the claim 1 rejection; “A security analysis method, comprising:

inputting a at least

one model related to

one or more factory assets;

monitoring access to

the factory assets

to learn at least one access pattern; and

generating

one or more security outputs

based on the model.”.

As per claim 16, this claim is the means plus function claim for the system claim 1 above, and is rejected for the same reasons provided for the claim 1 rejection; “A security analysis system in an automation environment, comprising:

means for receiving abstract descriptions

of at least one of

factory assets and

network devices;

means for

learning at least one access pattern;

means for generating  
one or more security outputs  
based on the abstract description; and  
means for automatically distributing  
the security outputs  
to facilitate network security in the automation environment.”.

6. Claim 2 *additionally recites* the limitation that; “The tool of claim 1,  
at least one of  
the interface component and  
the analyzer component  
operate on a computer and  
receive  
one or more factory inputs  
that provide the description.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted (i.e., interface component) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and

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costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

7. Claim 3 *additionally recites* the limitation that; “The tool of claim 2,  
the factory inputs include

user input,

model inputs,

schemas,

formulas,

equations,

files,

maps, and

codes.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted (i.e., interface component utilizing, at the very least, user input, model inputs, files, maps, and codes) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

8. Claim 4 *additionally recites* the limitation that; “The tool of claim 2,  
the factory inputs are processed by  
the analyzer component to generate the security outputs,  
the security outputs including  
at least one of  
manuals,  
documents,  
schemas,  
executables,  
codes,  
files,  
e-mails,  
recommendations,  
topologies,  
configurations,  
application procedures,  
parameters,  
policies,  
rules,  
user procedures, and  
user practices



that are employed  
to facilitate security measures in  
an automation system.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information, such that results (i.e., post analysis generated security outputs) used to evaluate (i.e., graphed output information, utilizing, at the very least, topologies, recommendations, files, rules, configurations)/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

9. Claim 5 *additionally recites* the limitation that; “The tool of claim 1,  
the interface component includes  
at least one of  
a display output having associated display objects and  
at least one input  
to facilitate operations with  
the analyzer component,  
the interface component is associated with  
at least one of

an engine,  
an application,  
an editor tool,  
a web browser, and  
a web service.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted (i.e., interface component, utilizing, at the very least, input editing tools, and a display output having associated display objects for the results graphic output) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

10. Claim 6 *additionally recites* the limitation that; “The tool of claim 5,  
the display objects include  
at least one of  
configurable icons,  
buttons,  
sliders,  
input boxes,

selection options,  
menus, and  
tabs,  
the display objects having  
multiple configurable  
dimensions,  
shapes,  
colors,  
text,  
data and  
sounds  
to facilitate operations with  
the analyzer component.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted (i.e., interface component, utilizing, at the very least, GUI oriented input editing tools, and a display output having associated display objects for the results graphic output) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

11. Claim 7 *additionally recites* the limitation that; “The tool of claim 5,  
the at least one inputs includes  
receiving user commands from  
a mouse,  
keyboard,  
speech input,  
web site,  
remote web service,  
camera, and  
video input  
to affect operations of  
the interface component and  
the analyzer component.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted (i.e., interface component, utilizing, at the very least, GUI oriented input editing tools, and a display output having associated display objects for the results graphic output) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a

function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

12. Claim 8 *additionally recites* the limitation that; “The tool of claim 1, the description includes
- a model of one or more automation assets
  - to be protected and
  - associated network pathways
  - to access the automation assets.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

13. Claim 9 *additionally recites* the limitation that; “The tool of claim 1, the description
- includes at least one of
  - risk data and

cost data  
that is employed by  
the analyzer component  
to determine suitable security measures.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model, clearly dealing with risk and effective cost insofar as network security per se is concerned) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

As per claim 13, this claim is the method claim for the system claim 9 above, and is rejected for the same reasons provided for the claim 9 rejection; “The method of claim 12,  
the at least one model is related to  
at least one of  
a risk-based model and  
a cost-based model.”.

14. Claim 11 *additionally recites* the limitation that; “The tool of claim 1,

the analyzer component is adapted for  
partitioned security specification entry and  
sign-off from various groups.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., the network partitioned security specification) and attack template (i.e., inclusive of authentication aspects, insofar as sign-on/sign-off, at the very least would be concerned) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

15. Claim 14 *additionally recites* the limitation that; “The method of claim 12,  
the security outputs include at least one of recommended  
security components,  
codes,  
parameters,  
settings,  
related interconnection topologies,  
connection configurations,  
application procedures,

security policies,  
rules,  
user procedures, and  
user practices.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information, such that results (i.e., post analysis generated security outputs) used to evaluate (i.e., graphed output information, utilizing, at the very least, topologies, recommendations, files, rules, configurations)/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

16. Claim 15 *additionally recites* the limitation that; “The method of claim 12, further comprising at least one of:

automatically deploying the security outputs  
to one or more entities; and  
utilizing the security outputs  
to mitigate at least one of  
unwanted network access and  
network attack.”.



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The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

17. As per claim 17; "A security validation system, comprising:

a scanner component

to automatically interrogate an automation system

at periodic intervals for

security related data [*ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended,*

*clearly encompassing the claimed limitations as broadly interpreted by the examiner.]; and*

a validation component

to automatically assess security capabilities of the automation system

based upon a comparison of

the security related data and

one or more predetermined security guidelines [*ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities (i.e., a validation component ...) as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.].*”.

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As per claim 26, this claim is the method claim for the system claim 17 above, and is rejected for the same reasons provided for the claim 17 rejection; “An automated security validation method, comprising:

scanning one or more networks or automation devices for  
potential security violations at periodic intervals; and  
performing an automated security procedure if  
a security violation is detected.”.

As per claim 30, this claim is the means plus function claim for the system claim 17 above, and is rejected for the same reasons provided for the claim 17 rejection; “An automated security validation system, comprising:

means for scanning one or more networks or automation devices for  
potential security violations;  
means for initiating a security procedure in response to  
the security violations; and  
means for performing at least one of  
security assessments,  
security compliance checks; and  
security vulnerability scanning  
to mitigate the security violations.”.

18. Claim 18 *additionally recites* the limitation that; “The system of claim 17,

the scanner component and  
the validation component  
are at least one of  
a host-based component and  
a network-based component.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system (i.e., host-based/network-based component) analysis tool using inputted (i.e., scanner component) computer system/network configuration/topology (i.e., description of factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

19. Claim 19 *additionally recites* the limitation that; “The system of claim 17,  
the validation component performs at least one of  
a security audit,  
a vulnerability scan,  
a revision check,  
an improper configuration check,  
file system check,

a registry check,  
a database permissions check,  
a user privileges check,  
a password check, and  
an account policy check.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component, insofar as associated with improper configuration, vulnerability, file system check, user privileges check, etc.), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

20. Claim 20 *additionally recites* the limitation that; “The system of claim 17,  
the security guidelines  
are automatically determined.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to

evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

21. Claim 21 *additionally recites* the limitation that; “The system of claim 18,  
the host-based component performs  
vulnerability scanning and  
auditing on devices,  
the network-based component performs  
vulnerability scanning and  
auditing on networks.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system (i.e., host-based/network-based component) analysis tool using inputted (i.e., vulnerability scanner component) computer system/network configuration/topology (i.e., auditing factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

22. Claim 22 *additionally recites* the limitation that; “The system of claim 21,

at least one of

host-based component and

the network-based component

at least one of

determines susceptibility to

common network-based attacks,

searches for

open TCP/UDP ports,

scans for

vulnerable network services,

attempts to gain identity information about

end devices that relates to

hacker entry,

performs vulnerability

scanning and

auditing

on

firewalls,

routers,

security devices, and

factory protocols.”.

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The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system (i.e., host-based/network-based component) analysis tool using inputted (i.e., vulnerability scanner component) computer system/network configuration/topology (i.e., auditing factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

As per claim 27, this claim is the method claim for the system claim 22 above, and is rejected for the same reasons provided for the claim 22 rejection; "The method of claim 26, further comprising at least one of:

- checking for
  - susceptibility to network-based attacks;
- searching for
  - open TCP/UDP ports; and
- scanning for
  - vulnerable network services."

23. Claim 23 *additionally recites* the limitation that; "The system of claim 21, at least one of



host-based component and  
the network-based component  
at least one of  
includes  
non-destructively mapping a topology of  
IT and  
automation devices,  
checking revisions and configurations,  
checking user attributes, and  
checking access control lists.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system (i.e., host-based/network-based component) analysis tool using inputted (i.e., vulnerability scanner component) computer system/network configuration/topology (i.e., auditing factory assets) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

24. Claim 24 *additionally recites* the limitation that; “The system of claim 17, further comprising

a component to automatically initiate a security action  
in response to  
detected security problems.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., automatically initiate a security action), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

25. Claim 25 *additionally recites* the limitation that; “The system of claim 24,  
the security action includes at least one of
- automatically correcting security problems,
  - automatically adjusting security parameters,
  - altering network traffic patterns,
  - add security components,
  - removing security components,
  - firing alarms,
  - automatically notifying entities about detected problems and concerns,
  - generating an error or log file,

generating a schema,  
generating data to re-configure or re-route network connections,  
updating a database, and  
updating a remote site.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information, such that results (i.e., post analysis generated security outputs) used to evaluate (i.e., graphed output information, utilizing, at the very least, topologies, automatically notifying entities about detected problems and concerns, generating an error or log file, generating data to re-configure or re-route network connections, updating a database, etc.)/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

26. Claim 28 *additionally recites* the limitation that; “The method of claim 26, further comprising at least one of:

automatically performing security assessments;  
automatically performing security compliance checks; and  
automatically performing security vulnerability scanning.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system

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analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., automatically performing security assessments, etc.), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

27. Claim 29 *additionally recites* the limitation that; "The method of claim 26, the automated security procedures include at least one of

- automatically performing corrective actions,
- altering network patterns,
- adding security components,
- removing security components,
- adjusting security parameters, and
- generating security data to mitigate network security problems."

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., adjusting security parameters,

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generating security data to mitigate network security problems, etc.), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

28. As per claim 31; "A security learning system for an automation environment, comprising:

a learning component

to monitor and learn automation activities during

a training period [*ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning/ monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.*];

and

a detection component

to automatically trigger a security event based upon

detected deviations of subsequent automation activities

after the training period [*ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities (i.e., a detection component ... trigger a security event ... after the training period) as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.*].”.

As per claim 39, this claim is the method claim for the system claim 31 above, and is rejected for the same reasons provided for the claim 31 rejection; “A security learning method, comprising:

monitoring a network for

a predetermined time;

automatically learning

at least one data pattern during

the predetermined time; and

· generating an alarm if  
a current data pattern is determined to be  
outside of a predetermined threshold associated with  
the at least one data pattern.”.

As per claim 41, this claim is the means plus function claim for the system claim 31 above, and is rejected for the same reasons provided for the claim 31 rejection; “A security learning system in an automation environment, comprising:

means for  
scanning a network;  
means for  
learning access patterns to at least one industrial automation device from the  
network; and  
means for  
generating a security event if  
current access patterns are determined to be  
out of tolerance from stored access patterns.”.

29. Claim 32 *additionally recites* the limitation that; “The system of claim 31,  
the automation activities includes at least one of  
a network activity and  
a device activity.”.

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The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system (i.e., host-based device activity /network-based activity component) analysis tool using inputted (i.e., scanner automation activities component) computer system/network configuration/topology and attack template information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended (i.e., validation component), clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

30. Claim 33 *additionally recites* the limitation that; "The system of claim 31, the learning component including
- at least one of
- a learning model and
- a variable."

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning/ monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized attack scenario(s), such that results



used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

31. Claim 34 *additionally recites* the limitation that; “The system of claim 31,  
the automation activities include

at least one of

a number of network requests,  
a type of network requests,  
a time of requests,  
a location of requests,  
status information, and  
counter data.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3,lines 10-col. 9,line 19, whereas the provided computer system analysis tool (i.e., learning/ monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities, such as number of network requests, type of network requests, location of requests, etc.,) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a

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function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

32. Claim 35 *additionally recites* the limitation that; “The system of claim 31,  
the detection component employs  
at least one of  
a threshold and  
a range to determine the deviations.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning detection/monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities, such as number of network requests, type of network requests, location of requests, etc.,) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

33. Claim 36 *additionally recites* the limitation that; “The system of claim 35,  
the threshold and

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the range

are dynamically adjustable.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning detection/monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities, such as number of network requests, type of network requests, location of requests, etc.,) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

34. Claim 37 *additionally recites* the limitation that; “The system of claim 33,  
the learning model includes

at least one of

mathematical models,

statistical models,

probabilistic models,

functions,

algorithms, and

neural networks,  
classifiers,  
inference models,  
Hidden Markov Models (HMM),  
Bayesian models,  
Support Vector Machines (SVM),  
vector-based models, and  
decision trees.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning/ monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized (i.e., mathematical, statistical, probabilistic models, etc.,) attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

35. Claim 38 *additionally recites* the limitation that; “The system of claim 31,  
the security event includes

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at least one of

automatically performing corrective actions,

altering network patterns,

adding security components,

removing security components,

adjusting security parameters,

firing an alarm, notifying an entity,

generating an e-mail,

interacting with a web site, and

generating security data

to mitigate network security problems.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., model) information dealing with hypothesized attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities (i.e., security event ... altering network patterns ... adjusting security parameters, generating security data, etc.,) as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

36. Claim 40 *additionally recites* the limitation that; “The method of claim 39,  
the at least one data pattern  
employed as input for  
a security analysis process.”.

The teachings of Swiler et al are directed towards such limitations (i.e., ABSTRACT, figures 1-2 and associated descriptions, col. 3, lines 10-col. 9, line 19, whereas the provided computer system analysis tool (i.e., learning/ monitoring/scanning component) using inputted computer system/network configuration/topology (i.e., polling/automatically interrogating of network machines (periodic interval scanning of automation activities) and gathering associated data such as IP address, machine type, operating system, file system structure, etc.,) and attack template (i.e., learning model) information dealing with hypothesized (i.e., mathematical, statistical, probabilistic models, etc.,) attack scenario(s), such that results used to evaluate/make configuration changes in the network to counter vulnerabilities as a function of the risks and costs associated with the changes recommended, clearly encompassing the claimed limitations as broadly interpreted by the examiner.).

***Response to Amendment***

37. As per applicant’s argument concerning the lack of teaching by Swiler et al of the ‘access patterns’, the examiner has fully considered in this response to amendment; the arguments, and finds them not to be persuasive.

At the very least, the Swiler et al ‘ ... the configuration file from which is obtained the information about topology of a computer system ... attack template ... attack information ... [i.e., col. 3,lines 51-col. 4,line 12]’ and ‘... gather information about network configuration and topology, Perl scripts ... used to poll machines ... stored in configuration files... [i.e., col. 5,lines 30-col. 6,line 29]’ aspects clearly represent access patterns of resources on a network (gathered/acquired manually or via automated Perl scripts), and generally factory assets per se, as *broadly interpreted by the examiner*, would therefore be applicable in the rejection, such that the rejection support references collectively encompass the said claim limitations in their entirety.

38. As per applicant’s argument concerning the lack of teaching by Swiler et al of ‘automatically interrogate ... periodic intervals ...’, the examiner has fully considered in this response to amendment; the arguments, and finds them not to be persuasive.

At the very least, the Swiler et al ‘ ... the configuration file ... attack information ... [i.e., col. 3,lines 51-col. 4,line 12]’ and ‘... gather information about network configuration and topology, Perl scripts ... used to poll machines ... [i.e., col. 5,lines 30-col. 6,line 29]’ aspects clearly represent gathered/acquired manually or via automated Perl scripts that are subsequently used in comparison to acquired data scanned in real time at clearly periodic intervals (i.e., the scanning data acquisition software/tasks/threads at some level are called on a periodic basis), as *broadly interpreted by the examiner*, would therefore be applicable in the rejection, such that the rejection support references collectively encompass the said claim limitations in their entirety.

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39. As per applicant's argument concerning the lack of teaching by Swiler et al of '... to mitigate the security violation ...', the examiner has fully considered in this response to amendment; the arguments, and finds them not to be persuasive.

At the very least, the Swiler et al response to the generation of output information as a result of the vulnerability analysis insofar as the said information is presented to a decision making entity (i.e., an operator/management entity per se, or another network device for automated response), clearly deals with mitigating the security violation aspects, as *broadly interpreted by the examiner*, would therefore be applicable in the rejection, such that the rejection support references collectively encompass the said claim limitations in their entirety.

40. As per applicant's argument concerning the lack of teaching by Swiler et al of '... learning component ... during a training period ...', the examiner has fully considered in this response to amendment; the arguments, and finds them not to be persuasive.

At the very least, the Swiler et al '... the configuration file ... attack information ... [i.e., col. 3, lines 51-col. 4, line 12]' and '... gather information about network configuration and topology, Perl scripts ... used to poll machines ... [i.e., col. 5, lines 30-col. 6, line 29]' aspects clearly represent gathered/acquired (i.e., learned as part of the configuration file/information setup/training the system) manually or via automated Perl scripts that are subsequently used in comparison to the acquired data scanned in real time, as *broadly interpreted by the examiner*, would therefore be applicable in the rejection, such that the rejection support references collectively encompass the said claim limitations in their entirety.



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41. As per applicant's argument concerning the lack of teaching by Swiler et al of '... monitoring a network for a predetermined time ... automatically learning ... data pattern ...', the examiner has fully considered in this response to amendment; the arguments, and finds them not to be persuasive.

At the very least, the above responses to the Swiler et al 'access patterns', 'automatically interrogate ... periodic intervals ...', '... to mitigate the security violation ...' and '... learning component ... during a training period ...', arguments, as *broadly interpreted by the examiner*, would therefore be applicable in the rejection, such that the rejection support references collectively encompass the said claim limitations in their entirety.

42. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Conclusion***

43. Any inquiry concerning this communication or earlier communications from examiner should be directed to Ronald Baum, whose telephone number is (571) 272-3861, and whose unofficial Fax number is (571) 273-3861 and unofficial email is Ronald.baum@uspto.gov. The examiner can normally be reached Monday through Thursday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser Moazzami, can be reached at (571) 272-4195. The Fax number for the organization where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. For more information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ronald Baum

Patent Examiner

NASSER MOAZZAMI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100

10/24/07

